

**LETTUCE (*Lactuca sativa* L.) PRODUCTION IN RECIRCULATING
HYDROPONIC SYSTEM EQUIPPED WITH
THERMO-ELECTRIC COOLER**

CLAIRE D. PARAYNO

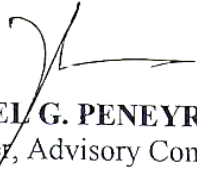
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**BACHELOR OF SCIENCE IN AGRICULTURAL AND
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ACCEPTANCE SHEET

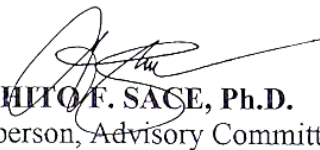
This undergraduate thesis entitled, “**LETTUCE (*Lactuca sativa* L.) PRODUCTION IN RECIRCULATING HYDROPONIC SYSTEM EQUIPPED WITH THERMO-ELECTRIC COOLER,**” prepared and submitted by **CLAIRE D. PARAYNO**, in partial fulfillment of the requirements for the degree **BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS ENGINEERING (Land and Water Resources Engineering)**, is hereby accepted:


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BIOGRAPHICAL SKETCH

The author born on the 6th day of March 1998, is the eldest child of Mr. Rodolfo B. Parayno and Mrs. Purificacion D. Parayno who resides at Sta. Lucia, Victoria, Tarlac. She learns how to overcome challenges in life, live a simple life and put God first.

Her elementary schooling education completed at Victoria West Central Elementary School (VWCES) in 2010. During her schooling, she competed in dancing and other extracurricular activities. After graduation she continued her secondary education at Victoria National High School (VNHS). During her secondary level, she focuses on her study. She graduated on 2014 with an academic distinction.

To pursue her dreams, she continued her tertiary education at Central Luzon State University, Science City of Muñoz, Nueva Ecija. She enrolled Bachelor of Science in Agricultural and Biosystems Engineering major in Land and Water Resources Engineering as her field of specification because of her interest in agriculture. She became a scholar for consecutive five years of CHED-DSWD ESGP-PA. She is also a member of a non-college based student's organization, Kapatirang Plebeians-CLSU Curia.

Her college life was well spent and full of challenging lessons that molded her to become an educated person. She well spent years in building a strong friendship to all the individuals and became her inspiration during ups and downs. In addition, she also spent because the author was able to develop his capabilities to make his dreams possible.

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ABSTRACT

PARAYNO, CLAIRE DAMASO, Department of Agricultural and Biosystems Engineering, Central Luzon State University, Science City of Muñoz, Nueva Ecija, **June 2019, LETTUCE (*Lactuca sativa* L.) PRODUCTION IN RECIRCULATING HYDROPONIC SYSTEM EQUIPPED WITH THERMOELECTRIC COOLER.**

Adviser: CHITO F. SACE Ph.D.

The study was conducted to determine the performance of thermoelectric cooler in recirculating hydroponic system for lettuce production. The specific aims of the study were: a) to determine the performance of peltier TEC by lowering the temperature of the nutrient solution in a recirculating hydroponic system on lettuce production b) to evaluate the growth performance of lettuce in a recirculating hydroponics system (RHS) fitted with thermoelectric (TEC) nutrient cooler, and c) to evaluate the water consumption and water productivity in RHS with thermoelectric cooler.

Lettuce seeds were directly seeded in growing cups containing the growing media. Environmental and water quality parameters of the systems were observed twice (8:00 am and 2:00 pm) daily to determine the response lettuce. Agronomic characteristics such as plant height and number of leaves, yield, water consumption and water productivity were also measured in the study. The study was subjected to recirculating hydroponic system with and without TEC and was analysed using CRD 2x2 factorial.

Lettuce produce using a RHS with TEC were taller at 17.90cm than grown without TEC at 17.65cm. The number of leaves was recorded the same value of mean of

10 in both systems. The results showed that RHS with TEC gave the higher yield of 1,400 grams compared with the yield of lettuce grown in RHS without TEC.

The total water consumed on the system with cooling was 308L and 322L for system without cooling system. The water productivity in the system with cooling was 4.5g/L and 3.72 g/L on system without cooling system.

}

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